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ABSTRACT

An approach for merging quantitative-qualitative data in order to enlarge the evaluators' perspective and provide an enriched data base for evaluating elusive evaluation problems in school settings is described. Mini-case studies were conducted over a period of three years in 11 urban schools to examine the impact of an arts-in-the-schools program and identify the cluster of factors that impede or enhance successful implementation and program effects. The replicable model for conducting mini-case studies and analyzing within and across school data illustrates that quantitative and qualitative data are integrative and serve a confirmatory purpose. Both qualitative and quantitative data have inherent limitations, however; integration of the two will extend the scope of the data base. Integration of the two types can generate new variables. Abandoning the view of quantitative and qualitative data as dichotomous permits the development of synthesizing methods for discerning program effects in an organized, rational, scientific manner. (Author/GK)

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Quantifying Qualitative Data: The Best of Both Worlds*

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The past two decades have witnessed both an intellectual and ideological struggle over what constitutes meaningful research methodology in the behavioral sciences. We need only read the opening two pages of many papers presented at AERA annual programs over the last several years to be cited a litany of the strengths and weaknesses of naturalistic versus experimental studies, quantitative versus qualitative methods, or soft versus hard research. The "old masters" are called up like heavy artillery to support a given position. One side or the other gets an additional bonus when it can reference a "hard" researcher going "soft" or vice versa. While some voices during the late 1960's called for eclectic approaches to research (Weiss and Rein, 1969; Weiss, 1970), these were lost in the noise of heated discussion.

Today, however, researchers are facing up to the magnitude of establishing certainty; no one research method can provide the answers. Boruch and Wortman (1979) call for an understanding of how quantitative and qualitative methods can be "exploited jointly and more systematically." Maltz, Kerker and Gainey (1980) speak of accommodation: while epistomologies differ, they share common elements in an attempt to understand phenomena. Cronbach and Associates (1980) have this to say on the subject:

> "The evaluator will be wise not to declare allegiance to either quantitative-manipulative-summative methodology or a qualitative-naturalistic-descriptive methodology. He can draw on both styles at appropriate times and in appropriate amounts. Those who advocate an evaluation plan devoid of one kind of information or the other carry the burden of justifying such exclusions." (p. 223)

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There is growing interest among evaluation researchers in the use of case studies to understand the social, organizational and political context of social programs. Case studies, many hasten to add, augment evaluation studies rather than stand alone. Lynn, Jr. (1980) calls on the use of case methods in policy analysis to help grapple with the context, but cautions analysts to use other analytical methods as well. Baltzell (1980) reflects on the need to integrate quantitative and qualitative methodologies to compensate for shortcomings of both. She proposes a "standard case study" to facilitate the integration. Cronbach and Associates (1980) see the role of qualitative case studies within a statistical plan. Cautionary note is sounded by Boruch and Wortman (1970) if case studies are permitted to stand alone and not incorporated in a larger summative research design:

> "An outcome evaluation which relies very heavily on these case reports, especially if they cannot be tied to the macro-level processes underlying program success or failure, is unlikely to be much more than employment programs for the ethnographically inclined." (p. 319)

The Problem

The Office of Evaluation Research faced the task of conducting an evaluation of an arts-in-the-schools program over a three-year period. Obtaining quantitative data was not the problem, especially when word was handed down from higher administration to cooperate. But getting a handle on an elusive program was another matter. Like most social programs conducted in large urban schools, identifying the program *in situ* presented difficulties. Without an understanding of what the program looked like from one school to the next, and the contextual forces impinging on program implementation, the

standard quantitative data would be uninterpretable. Once the evaluation was underway, it became clear to us that the textbook approach to program evaluation, that is, obtaining student and teacher data on an array of variables in a pre-post/experimental-control design, would not illuminate program effects nor provide the decision maker with information on how to adapt or modify the program should it be retained. We settled on the inclusion of mini case studies of each school as a methodological vehicle for obtaining descriptive data. This approach differs from the standardized case study reported by Baltzell (1980) in that our instruments for collecting qualitative data were more detailed than topic outlines but sufficiently flexible to permit reporting of events and perspectives not specifically identified in the instruments. Our problem, then, was to bring together the best of both worlds. We needed to find how to integrate the two worlds: (1) by fitting qualitative descriptions into a quasi-experimental design; (2) by using the qualitative data to confirm the quantitative finding; (3) by using both types of information dialectically, thereby creating a new synthesis.

The Model Builders Project and the Schools

The Model Builders Project (MBP) was a three-year arts-in-the schools program sponsored by a private, non-profit urban-based organization. The purpose of the MBP was to integrate art-related activities into the existing curriculum of urban, lower socioeconomic status schools and thereby enrich the lives of students, teachers, parents, and the general community. At the inception of the MBP, five goals were formulated to give direction to the program:

1. To enable teachers to integrate the arts into the teaching of core curriculum;
2. To sustain and promote new avenues of communication between home, school, and community;

3. To enable children to use the arts as a resource for communication and self-realization, and as a means for sharpening perception and facilitating conceptual learning;
4. To strengthen the skills and understanding of the artist/instructors who plan and carry out the program;
5. To continue research and the development of replicable models for the integration of the arts into the total instructional program.

Ten Chicago inner city schools with the following characteristics were selected to participate in the MBP: 1) serve a large minority population, 2) situated in lower-income area of Chicago, 3) completed an application for participation in the MBP, 4) demonstrated a commitment of teachers, administrators, and parents to participate in MBP and its evaluations, and 5) agreed to provide necessary physical facilities and equipment. By concentrating the Project's resources in 10 sites, the effects of a total impact program could be tested without straining limited MBP resources. A total of 13 experimental schools (one site included a cluster of four schools) participated in the program. The MBP continued in the 10 sites through Year 2. In the third year, the cluster site became an Academic Interest Center in the Chicago School System's Access to Excellence Program. In addition, in the third year one school site by mutual agreement discontinued participation, leaving eight schools in the Project.

Two matching schools, selected as comparison schools, were also examined over the three year period, to serve as bench marks for measuring changes in the MBP schools. One comparison school was viewed as a "model" inner city school, one that was said to function. The other had all the stereotypic problems associated with an inner city institution. Because these schools represented extremes rather than typical schools, they assumed two ends of an educational

continuum on which the MBP schools could be viewed. We found this way of representing a control in our evaluation design to be a rich source of comparative data.

The key to the program were practicing artists who served as artist/instructors. They could bring to teachers and the classes a vitality unemcumbered by many of the rules and regulations of a large system. A number of program offerings made up the MBP. These included MBP courses taught by artist/instructors for teachers, other school staff, and principals; all-school assemblies; inservice workshops; artist/instructor "parlor meetings" with parents; artists/instructor visits in the classrooms; city-wide principal meetings; city-wide teacher, principal, and artist/instructor workshops; and parent participation in a city-wide, community council sponsored by the arts organization.

The Structure of the Mini-Case Studies

The Office of Evaluation Research (OER) viewed its evaluation role throughout most of the three years as formative. Each year's evaluation design focused on obtaining information about MBP's operations from several perspectives. In Year 1, a rather traditional pilot test design was used. Three groups of teachers and students were identified: 1) experimental (EXP): MBP participants, 2) comparison 1(C-1): non-MBP participants in one of the 10 MBP sites, and 3) comparison 2(C-2): non-MBP participants in one of the two comparison (non-MBP) schools. Self-reporting questionnaires, structured interviews, and structured classroom observations were completed to gather data permitting the following comparisons: 1) EXP, C-1 and C-2 classrooms on students' perception of their classroom learning environment, 2) EXP and C-1 students on degree of program implementation, 3) EXP, C-1, C-2 teachers on art related activities, and 4)

EXP teachers and artist/instructors on course evaluations. Thus, the tenets of good quantitative research design were followed. However, when the data were analyzed, these measures discerned no project impact. Yet, when OER staff visited the schools, there were signs of project awareness and activities. There were also signs of external forces that impeded the functioning of the project. It was evident to OER staff that both internal and external occurrences impinging on the project were not being captured by traditional instrumentation. OER concluded that the instruments were too tightly structured to capture what was really happening in the schools and to the schools. Rather than blaming non-impact on external forces, OER felt a need to gather more personal and detailed descriptions of each school. In order to obtain a clearer picture of how the project functioned under differing and common sets of constraints at different school sites, OER developed a mini-case study procedure. The mini-case studies were conducted in Years 2 and 3 to examine impact both within a given site and across all sites (in addition to Year 1 types of data).

Obtaining approval to conduct case studies took some planning. At a meeting with all the principals in the project, OER shared the first year's evaluation data, and some of the problems of getting at subtle types of data. Permission for three-member teams to have access to all classrooms, all other educational supporting resources in the school and personnel was obtained. It took two very committed principals, however, to convince their colleagues that this wasn't a threatening act; rather, it would help improve the project and its implementation.

Data for the mini-case studies were gathered from semi-structured, albeit open-ended observation and interview instruments by trained observers and interviewers. The School Observation Form and interview forms were devised to yield parallel data, yet were sufficiently flexible to permit gathering of data not falling into discrete, predictable categories. Thus each mini-case

study included comparative data that were also amenable to aggregation. The primary purpose of the instruments was to reach all C-1 staff who could in some way affect the schools' program and could give important perspectives on the functioning of the program. Thus, potential data sources included principals, other school administrators, teachers, custodians, lunchroom personnel, office staff, students, school community representative and parents, as well as the artist/instructors and the agency's staff. The School Observation Form was divided into nine sections: 1) physical characteristics, 2) social and inter-personal environment, 3) materials and equipment availability and utilization, 4) academic environment, 5) evidence of MBP-related activities (for the control schools, general arts-related activities were observed), 6) classroom environment, 7) behavior norms, 8) parents and visitors, and 9) overall impressions. For each section, semi-structured, open-ended questions were responded to (e.g.: describe examples of social interactions you observe in the student lunchroom; describe the relationship of teachers to each other--do they freely socialize or keep to themselves) and general, non-structured, open-ended impressions of OER staff were recorded (e.g., characterize the social environment; what is your overall impression of this school; how does the reward system work). The only restriction on the open-ended impressions was that all statements had to be supported by observable evidence (including statements by data sources). For example, if an observer stated: "Although there is little evidence of Model Builders activities in classrooms, there is indirect evidence of MBP impact," accompanying data to support that statement was required: "No MBP-related activities were observed in the classrooms. However, several teachers reported using drama in one form or another in their classes and in several classes, art projects from last year's MBP involvement were on display." (Data sources: classroom, hallways, teachers.)

The Pincipal Interview (PI) was divided into six sections: 1) MBP demands on the school's operation, 2) extent of principal involvements and support of MBP, 3) effectiveness of MBP activities in school, 4) observable changes in academic or social environment that can be attributed to MBP, 5) extent of teacher and parent involvement in MBP, 6) external forces affecting MBP's implementation. Interviewers were instructed to cover 16 specific points in the interview; however, probing questions, the order in which points were covered, and additional questions (based on what had been observed during completion of the school observations) were left to the discretion of the interviewer. The interviewees were encouraged to document all statements with examples.

School Observation Forms were completed independently by 3 observers who each spent an entire day at the school. Observers were given free reign by the principals to enter any and all classrooms and other school facilities (lunchroom, playgrounds, gyms, special-function rooms, etc.). Principal interviews were conducted by the designated leader of each three-person observation team. The leader was one of three OER staff members involved with the MBP evaluation from its inception; in most cases a strong relationship of trust had been developed between the team leader and school principal. Semi-structured interviews with the school-community representatives, and informal interviews with custodians, parents in the building, office staff, food service staff, faculty and students were additional sources of data. On completion of the observations and interviews, the three-member teams combined their information and impressions on a single observation form, from which the team leader wrote a draft summary case study and submitted the draft to the other team members. Initially the plan was to enter the final approved case study as part of the formal data bank in two forms: as self contained mini-case studies by school and as a single case study of the total project.

Organizing, Quantifying, and Analyzing the Case Study Information

OER had originally planned to organize the evaluation report into two sections: 1) quantitative data and 2) supplementary qualitative data. The mini-case studies and composite case study would provide the background for interpreting the quantitative analyses. As the case studies were being prepared, however, it became evident to OER staff that much of the qualitative data being gathered had quantifiable aspects that were relevant and important not only to a composite case study but as additions to the quantitative data bank. These patterns within the qualitative data were converted into quantitative form via categorization and ratings and added to the already-gathered quantitative data. Table 1 shows a draft form for summarizing descriptive and quantitative data in preparation for integrating the information. But the overlapping and combining of quantitative and qualitative data (and vice versa) did more than supplement each other. Integration of data permitted OER staff members to reach higher levels of understanding of interrelationships. In addition to the two data forms providing supportive information, a spiral effect was occurring; each type of information when combined displayed a dynamic interconnectedness. The integration was leading to a synthesis which produced a new variable. For example, consider the variable of principal support.

From the qualitative data gathered through principal interviews and the quantitative data from teacher and artist/instructor questionnaires, a quantitative rating of principal support of the MBP was assigned (1 = minimal to 4 = extensive). From MBP's archival attendance records, the quantitative data of whether or not the principal attended the semester-long MBP course taught by the artist-instructors was determined (1 = no, 2 = yes). From the quantitative Course Evaluation Questionnaires completed by MBP teachers,

Table 1. Comparative Summary Table of Case Studies by School

Initial Draft

School	General Appearance	Art-Related Activities	Learning Emphasis	Teaching Learning Characteristics	Principal	Parent	Course	My Class (Learning Environment)
A	more open than previously	more art displays in rooms and hallways	cognitive	increase in positive affective learning	increase Project support	some; assemblies	rated + lower in second year	Satisfaction (-)
B	unchanged	poetry illustrations; much art; TV	cognitive	participants higher on 11 of 13 characteristics	more than previously	not on class level; assemblies	3 of 4 rated high	Satisfaction (-); no other changes
C	open	MB activities in classes; photography; creative writing	some affective	more affective; spin-off effect	high level support	parlor meetings	year 1 and 3 rated high high	positive increase in Satisfaction and Cohesion; higher LTP
D	still tight, friendlier	music; art; class activities	both	more creative and affect	strong support	some with a strong commitment	3 of 4 rated very high	Satisfaction (no change); Friction decreased
I	no change	little visible display	cognitive	not enough data to compare	beginning to appreciate role in MB	active in Child Parent Center; parlor meetings	all 4 rated high	Satisfaction (-); Cohesiveness (-)

Table 1. Comparative Summary Table of Case Studies by School (continued)
Initial Draft

School	General Appearance	Art-Related Activities	Larning Emphasis	Teaching Learning Characteristics	Principal	Parent	Course	My Class (Learning Environment)
J	a show case	considerable evidence	cognitive and affective	more creative; imaginative	gung-ho	active	3 of 4 rated high	no change on any of 7 scales
K	same; teachers open, friendly	music teacher provides considerable art activities	cognitive	good portion of teachers have been in MB course; little differences among teachers	hands-off policy; delegated authority for coordinating MB	active; also in Council with SCR	1st year only fair; 2 and 3 rated high	Satisfaction no change
L	cautious but friendly	pervasive in halls	cognitive	big difference between the two groups	supportive	active	rated lower in Year 1 and 2; Year 3 course outstanding	Satisfaction no change; Cohesiveness (+)

a quantitative course effectiveness rating was obtained (1 = low to 4 = high). From the qualitative school observations, an overall extent of implementation of MBP activities rating was determined (1 = low to 4 = high). When each of the three independent variables (principal support, principal course attendance, and course effectiveness) were correlated with the dependent variable (extent of MBP implementation), critical information was obtained that was not evident from independent analyses of quantitative and qualitative data.

Neither the principals' participation in the course nor course effectiveness ratings correlated significantly with the extent of implementation ($r = .08$ and .00 respectively). All three factors combined as a single score significantly correlated with extent of implementation ($r = .576$, $p \leq .10$). This level of significance was not considered by OER sufficient to make predictive statements. However, when extent of implementation was correlated with principal support, the coefficient was significant at the .01 probability level ($r = .74$).

On semi-structured questionnaires, teachers reported that the most important factor in whether or not MBP activities were implemented in their classroom was their principal's encouragement to use MBP activities. This corroborated our initial findings, although there is some overlap because teacher ratings of principal support contributed to, but were not the sole criterion, for the principal support variable described above.

The spiral effect of integrating quantitative and qualitative data is clearly shown. In Year 1's gathering of quantitative data, no program effects were discerned, yet the evaluators "felt" there was program impact. In Year 2 and 3 additional gathering of qualitative data in an open-ended, yet systematic manner, provided data not solely obtainable by quantitative means. But level of principal support and extent of implementation could be measured only by integrating quantitatively and qualitatively obtained data. From

these ratings, we discovered the main source of program implementation: principal support. Thus, the inadequacy of the quantitative data alone led to the integration of quantitative and qualitative data creating new quantifiable categories that permitted more sophisticated analysis than otherwise possible.

Through our data-gathering techniques we could probe the context in greater depth. Why did principal support vary? Each of the participating schools had requested implementation of the MBP and were selected because of their strong assurances of support. What happened between the time of application to participate in MBP and Years 2 and 3?

To respond to these questions, we turned again to our case studies for our general knowledge of the school context and MBP implementation. First, from our principal interviews we discovered that there had been considerable dissatisfaction with the MBP project director and some artist/instructors during Year 1. Aware of these problems, the sponsoring arts organization replaced the first MBP project director with a new staff member who they felt could better meet the needs of MBP schools. The new director, partly on the basis of the quantitative course ratings obtained in Year 1, replaced the ineffective artist/instructors. In addition, a new staff member was hired to work directly with parents.

Our examination of other external forces also helped us to understand variations in principal support. The Chicago Public School System, at the beginning of Year 1, committed itself to a continuous progress instructional program in reading and mathematics. The central office's push to improve reading and mathematics skills were interpreted by many principals as a mandate to set aside most other aspects of the educational program in order to improve reading and math scores. Teachers, too, felt this pressure and interpreted any other activities not directly related to math and reading skill building

as beyond the reward structure. As a result, MBP activities in many schools faced enormous difficulty in competing for class time with the continuous progress program. Teachers and principals in all schools corroborated these observations unsolitiçated in final interviews, informal conversations, and in the implementation questionnaire. Those experimental principals who showed the most concern about the narrowness of the continuous progress focus and who indicated the necessity of MBP activities to offset this narrowness gave the most program support and, in turn, MBP was most successful in their schools.

Still another factor affecting principal support was a major change by the central administration in faculty and principal school assignments for the purpose of ensuring staff racial balance and desegregating faculty. In Year 2, two of the ten principals who had worked cooperatively with the MBP in the first year were transferred, as were many teachers who were MBP participants. This meant loss of administrative support and enormous effort by MBP staff to rebuild relationships. It also resulted in the loss of carry-over by teachers previously involved in MBP couses.

Thus the quantitative findings alone could not reflect the full impact of the project on classroom art-related activities. To overcome the personnel loss and to offset the negative effects of the continuous progress program in implementing art-related activities placed an undue burden on MBP. The fact that commitment for continued participation in the project was retained by most participants and that art-related activities were observed despite all obstacles pointed up the vitality of the project. To sustain itself in spite of these enormous negative forces gave additional meaning to the quantitative findings.

The comparison groups were both adversely affected by these external forces. Classroom learning activities in the "model" school over the three year period tended to be less creative, and the faculty less cohesive. The comparison school on the other end of the continuum was further bogged down

by inertia. The students in both comparison schools indicated less positive perceptions of their learning environment over the three-year period.

Quantifying Qualitative Data: The Best of Both Worlds

We have presented above one detailed example of how quantitative and qualitative data can build upon one another in program evaluation. In fact, within the same program, using the same techniques, we were also able to discover the attributes of effective artist/instructors. We have also used similar techniques in other program and curriculum evaluations. The importance of our findings, we feel, are not specific to the one example presented here. On the contrary, we feel that this example illustrates the futility of the quantitative versus qualitative dichotomy.

Both quantitative and qualitative data have inherent limitations. It makes sense that an integration of the two will extend the scope of the data base. The spiraling effect of integrating the two types of data can generate new variables. By abandoning our view of quantitative and qualitative data as dicotomous, we can work on developing synthesizing methods for discerning program effects in an organized, rational, scientific manner.

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